Ex 17.2 Weighing Venus Atmosphere

$P_{surf.\ venus}$ = 90 atmospheres (90 times that of Earth's surface)

So the weight of Venus atm. could support a column of mercury $(760\text{mm}) \times (90) =$ 68400 mm high.

The surface are of venus is $SA = 4\pi r^2$

$= 4.6 \times 10^{14}\ m^2$

$= 4.6 \times 10^{20}\ mm^2$

The volume of this mercury ocean would be then

$$V = 3.15 \times 10^{25}\ mm^3$$

The weight would be $\boxed{4.25 \times 10^{23}\ kg}$

or $\boxed{9.36 \times 10^{23}\ lbs}$